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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/814,620	03/22/2001	Scott Patrick Hanson	ROC920000286US1	3982

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Gero G. McClellan
Thomason, Moser & Patterson, L.L.P.
3040 Post Oak Boulevard, Suite 1500
Houston, TX 77056-6582

EXAMINER

NAHAR, QAMRUN

ART UNIT	PAPER NUMBER
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2124

3

DATE MAILED: 05/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/814,620

Applicant(s)

HANSON ET AL.

Examiner

Qamrun Nahar

Art Unit

2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

1. Claims 1-28 have been examined.

Specification

2. The disclosure is objected to because of the following informalities: BRIEF DESCRIPTION OF THE DRAWINGS section does not include a description for figure 9C.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Ungar (U.S. 6,085,035).

Per Claim 1:

The Ungar patent discloses:

- a method for optimizing a run time for an object code generated from a source code (“The invention determines the type usage pattern for the data-values stored in the variable and

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accordingly optimizes some of the computer instructions used to access the variable.” in column 3, lines 30-33)

- **extracting information for each procedure call contained in the source code** (“With a static compiler, the program is first profiled and the optimization process 300 is invoked during a subsequent compilation that utilizes the profiled data. The ‘maintain type identifier’ procedure 303 saves the type of a data-value stored in a variable in a type identifier associated with the variable. For example, the type identifier indicates when an integer data-value is stored in the variable. One skilled in the art will understand that some implementations of the invention use the type identifier to distinguish between a pointer and an integer. Other implementations use the type identifier to distinguish between a larger set of types (such as the pointer type and primary types). Next, a ‘determine type usage pattern’ procedure 305 evaluates the type mutability of the typed data-values stored in the variable. That is, the ‘determine type usage pattern’ procedure 305 determines whether only data-values having a specific type are stored in the variable. The typed data-values are type mutable if data-values of different types can be stored in the variable. However, if the stored data-values are of only one type the data-values are type immutable. This determination can be made from run-time data gathered by a profiler-instrumented program compiled by a static compiler or by a the run-time and compiler states of a program compiled by a dynamic compiler. The ‘determine type usage pattern’ procedure 305 also determines, for mutable data-values, which types are most used (the preferred types).” in column 8, lines 11-41)

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- selecting a call linkage between a caller procedure and a callee procedure for each procedure call using the extracted information, where the selected call linkage is optimized to minimize a run time of an object code generated from the source code; generating the object code from the source code; and running the object code using the selected call linkages for each procedure call (“A first preferred embodiment optimizes both a called routine and the call site dependent on the types of the data-value passed from the call site to the called routine. Because data-values contained in passed entities (that is, the data-values contained in variables and/or the addresses of the variables themselves) can be specified as arguments to, or a result from, a called routine, the call site generally contains code to select which executable version of the called routine to invoke dependent on the types of the passed entities. The invention detects variables that have immutable types (from the ‘determine type usage pattern’ procedure 305) and optimizes both the called routine and the call site dependent upon the type-mutability of the passed entities. Additionally, if the variables have mutable types, the invention generates multiple versions of the called routine (each optimized for a preferred type as determined by the ‘determine type usage pattern’ procedure 305) that are invoked dependent on the types of the passed data-values. Often, one of these called routine versions is not optimized with respect to any of the passed data-values and so is capable of processing any pattern of types of the passed data-value.” in column 8, lines 52-67 to column 9, lines 1-7).

Per Claim 2:

The Ungar patent discloses:

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- wherein the determined call linkage is one of a memory-based call linkage and a register-based call linkage (column 9, lines 22-67 to column 10, lines 1-21).

Per Claim 3:

The Ungar patent discloses:

- wherein, if the memory-based call linkage is selected for a particular procedure call, the running comprises: allocating a block in a memory to store a value for each argument in the particular procedure call; storing the value for each argument from a register in a processor to the block in the memory; branching the procedure call to a callee procedure, and loading the value for each argument from the block in the memory back to the register (column 10, lines 7-21).

Per Claim 4:

The Ungar patent discloses:

- wherein, if the register-based call linkage is selected for a particular procedure call, the running comprises: copying a value, for each argument in a procedure call, from a register in the processor to a parameter register in the processor; branching the procedure call to a callee procedure; and copying the value from the parameter register back to the register (column 9, lines 60-65).

Per Claim 5:

The Ungar patent discloses:

- wherein the selecting comprises: detecting whether an error exists for the procedure call; selecting the memory based call linkage if the error is detected for the procedure call; and selecting the registered based call linkage if no error is detected for the procedure call (column 9, lines 60-65 and column 10, lines 7-21).

Per Claim 6:

The Ungar patent discloses:

- wherein the error is detected if the procedure call has a different number of parameters than the callee procedure (column 10, lines 7-21).

Per Claim 7:

The Ungar patent discloses:

- wherein the error is detected if a parameter type for a parameter in the caller procedure is different than the parameter type for the parameter at a corresponding position in the callee procedure (column 10, lines 7-21).

Per Claim 8:

The Ungar patent discloses:

- wherein the error is detected if a number of arguments in the procedure call is greater than a number of parameter registers used to run the object code (column 10, lines 22-50).

Per Claim 9:

The Ungar patent discloses:

- wherein the error is detected if an argument in the procedure call is unpassable in a register (column 10, lines 51-61).

Per Claim 10:

The Ungar patent discloses:

- wherein the extracting of procedure call information comprises: extracting information for each procedure definition contained in the source code (column 8, lines 11-41 and column 9, lines 8-21).

Per Claim 11:

The Ungar patent discloses:

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- wherein the extracted procedure call information comprises an identifier for a calling procedure and a callee procedure, and the extracted procedure definition information comprises a number of arguments received by the procedure and a classification for each argument (column 9, lines 35-67 to column 10, lines 1-21).

Per Claim 12:

The Ungar patent discloses:

- wherein the call linkage is selected in a class comprising one of a register stacks call linkage, a system call linkage and a near versus far call linkage (column 9, lines 22-65).

Per Claim 13:

The Ungar patent discloses:

- wherein the extracted information is generated in a data structure used to select the call linkage for each procedure call (column 9, lines 8-21).

Per Claims 14-15:

These are apparatus versions of the claimed method discussed above, claim 1, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above, including “a memory for storing a compiler program; and a processor comprising a plurality of

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registers, where a subset of the plurality of registers comprise parameter registers" (column 3, lines 44-57). Thus, accordingly, these claims are also anticipated by Ungar.

Per Claims 16-20:

These are apparatus versions of the claimed method discussed above (claims 2, 5, 10, 11 and 13, respectively), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Ungar.

Per Claims 21-28:

These are computer readable medium versions of the claimed method discussed above (claims 1-5, 10-11 and 13, respectively), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also anticipated by Ungar.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

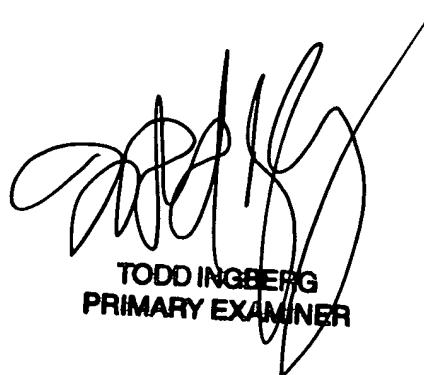
6. Any inquiry concerning this communication from the examiner should be directed to Qamrun Nahar whose telephone number is (703) 305-7699. The examiner can normally be reached on Mondays through Thursdays from 9:00 AM to 6:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki, can be reached on (703) 305-9662. The fax phone number for the organization where this application or processing is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QN
April 30, 2004



TODD INGBERG
PRIMARY EXAMINER